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Heat Stress in Livestock

I might be the only one who feels this way, but it seems like the Kansas weather no longer gives us an extended transition period of beautiful spring weather. More often it feels like we jump directly from winter to summer heat. May was especially warm, June hot at times, with some catastrophic examples of heat stress across the state, and the past week or so has again shown how hot and humid Kansas can be. Let's take a look at some livestock heat stress basics.

As temperatures heat up livestock producers need to assess the heat stress that their livestock are under. While this article will mainly discuss cattle, the same basic principles apply to all classes of livestock. Animals need to have the ability to seek shade, water, reduce physical activity, adjust feeding times and have good air movement, to cool themselves.

At temperatures above 80 degrees Fahrenheit animals begin enduring physiologic stress dealing with heat load. Cattle cannot dissipate their heat load very effectively, with their reduced sweat efficiency, and rely on respiration to cool themselves. Ruminates in general, deal with a compounding heat factor, on top of climatic conditions, the heat energy generated during the fermentation process within the rumen.

Animals accumulate a heat load during the day and dissipate heat at night when it is cooler. Cattle's core temperature peaks 2 hours after peak environmental temperature. It also takes at least 6 hours for cattle to dissipate their heat load. During extreme weather conditions of high heat and humidity, insufficient environmental night cooling can lead to accumulated heat not being dispersed. So, now that we understand a bit of how heat can accumulate/dissipate, what can managers do to deal with heat stress? Here are some basic management tips:

- Water requirements increase during heat stress. Water supply should be able to deliver 1.1% of body weight per hour. A 1000-pound animal needs about 1.5 gallons of water per hour.
- Heat production from feed intake peaks 4 to 6 hours after feeding. Decrease feeding during the heat of day. Feed 70 percent of the animals' ration as late in the evening as possible. This will put the peak heat of digestion overnight when temperatures are likely cooler.
- Shade is critical during extreme heat events, especially with black hided, heavy-weight animals. To be effective there needs to be 20 to 40 square feet of shade per beef animal.
- Increasing air flow helps animals cope with extreme heat events. Animals should be moved to areas with more air flow when possible and/or be given more space between animals in a pen. In barn settings, make sure fans continue to run and have a backup energy source.
- Sprinklers increase evaporative cooling and can reduce ground temperature. When used, sprinklers should thoroughly wet the animal and not just mist the air to effectively cool.
- Do not work livestock during times of extreme heat and only early in morning when it's hot.

Two very important tools that can help managers monitor potential heat stress are: The U.S. Meat Animal Research Center's seven-day forecast tool looking at; temperature, humidity and solar radiation <https://www.ars.usda.gov/plains-area/clay-center-ne/marc> The second is the Kansas Mesonet animal comfort index. This network of observation towers located across the state (Corning and Oskaloosa in Meadowlark District) that updates climate information hourly <https://mesonet.k-state.edu/agriculture/animal/#tab=resource-tab>

Animal observation is critical to know when animals are in suffering from heat stress. As heat stress increases animals will begin to slobber and respiration rates will increase. Severe heat

stressed animals will be open mouth breathing, with a labored effort. The time to prepare for heat stress is not during a heat event, you need to have a plan in place to address the basic animal cooling needs. Know the warning signs, be prepared with management strategies and utilize the online weather resources at our finger tips.